Greater Sage-Grouse (*Centrocercus urophasianus*) State Rank: S2
Global Rank: G3G4

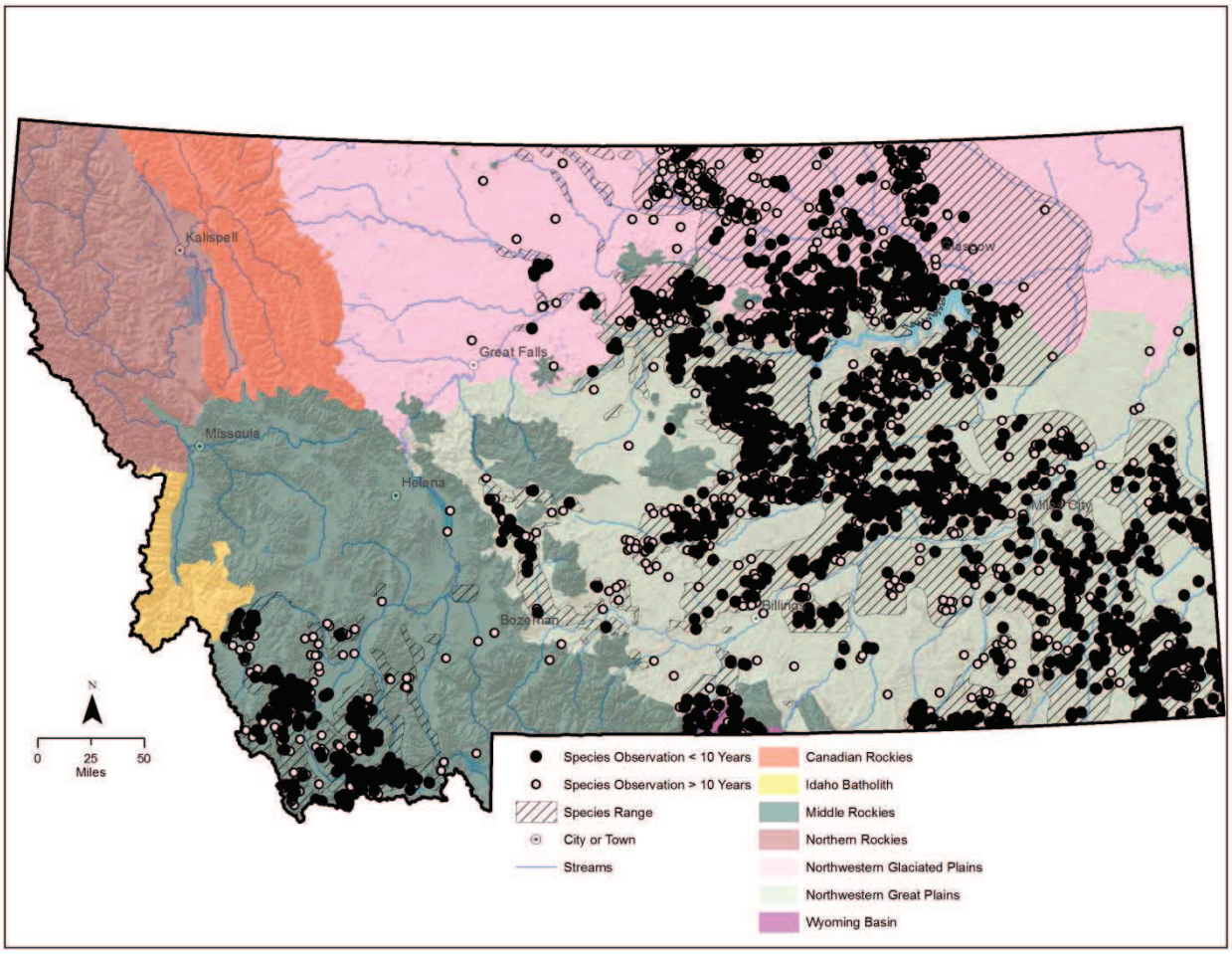

Figure 32. Montana range and observations of the greater sage-grouse

Habitat

Greater sage-grouse select specific habitat characteristics in response to season and life stage. During the spring breeding season, males congregate on display areas to attract females. Leks, which usually consist of clearings surrounded by sagebrush, are revisited annually. The majority of greater sage-grouse nests are located within 3 miles of a lek. Hens generally nest under stands of sagebrush 12 to 30 inches in height, seeking taller shrubs in a stand for nesting. Residual grass (remaining from the previous growing season) is important for providing nest concealment from predators and the probability of sage-grouse selecting a nesting site increases with increasing residual grass height. After eggs hatch, hens seek relatively open sagebrush stands with more than 15% grass and forb canopy cover. Insects and succulent forbs provide critical food for young broods. As summer progresses and upland forbs desiccate, hens will move broods to moist sites along drainages, ditches, or irrigated meadows/hay crops. In general, moist areas with standing herbaceous cover, for concealing broods from predators, interspersed with sagebrush grasslands provide high-quality brood habitat. Improvements in native grass and forb height and density generally translate into better nest success and brood survival. During late fall and winter, greater sage-grouse feed almost exclusively on sagebrush. Wintering greater sage-grouse

typically prefer extensive stands of sagebrush with 10 - 30% canopy cover. However, sage-grouse will move to areas of exposed sagebrush for food and cover if deep snow conditions are present.

Contiguous large blocks of intact, functional sagebrush grassland are best suited for meeting yearlong needs of greater sage-grouse. Limited seasonal habitats (e.g., nesting cover, brood rearing habitat, winter habitat, etc.) may restrict the abundance, productivity, or occurrence of greater sage-grouse in a particular area.

Management

Greater sage-grouse are managed under state authority, including the statutory authority to regulate harvest. Legislative mandate designates the greater sage-grouse as an upland game bird (87-2-101, MCA).

FWP, in conjunction with federal land management agencies and conservation groups, monitors greater sage-grouse populations during spring through a census of displaying males on leks. The post-harvest telephone survey provides an estimate of harvest for all upland bird species, trends in hunter numbers, and number of birds by species taken by hunters.

In 2008, FWP identified and mapped the areas that are most important to the persistence of sage-grouse populations in the state. These "Core Areas" were based on densities of displaying males and associated habitat. State, federal, and local partners use these Core Areas to focus conservation and management action designed to benefit sage-grouse.

State-funded cooperative habitat projects have the potential to benefit greater sage-grouse. In 1987 the Montana legislature created a process and funding source for FWP to purchase conservation interests in important wildlife habitats through conservation easements and fee title acquisitions. The program generates funding from an earmarked portion of license revenue and provides an innovative tool to protect habitat at the state level. The Upland Game Bird Habitat Enhancement Program was developed through a series of Montana legislative sessions from 1987 to 2001. This program funds habitat enhancements on private and public lands such as vegetation plantings, grazing management systems, and leases. The program helped fund (in combination with the USFWS Landowner Incentive Program) the Montana Sagebrush Initiative, which is a 30-year private land lease program designed to conserve high-priority sagebrush grasslands from prescribed fire, herbicide applications, plowing, and other practices intended to reduce or eliminate sagebrush and forbs.

Federally-funded cooperative habitat projects are also available through the NRCS Sage Grouse Initiative. This initiative accesses several different funding sources for sagebrush restoration, enhancement, and conservation on private lands. Priority projects for these funds are located within FWP's sage-grouse Core Areas. Other federal land management agencies (i.e., BLM, USFS) also prioritize management for sage-grouse within Core Areas.

On March 5, 2010, USFWS determined that the greater sage-grouse warrants protection under the ESA, but that listing the species under the Act is precluded by the need to address other listing actions of a higher priority.

Management Plans
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Montana Sage-grouse Habitat Conservation Advisory Council. *In prep*. DRAFT Greater Sage-grouse Habitat Conservation Strategy.

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Greater Sage-Grouse Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Fragmentation of sagebrush grasslands (e.g., energy development, power lines, roads, urban sprawl)	Fragmentation of sagebrush grasslands (e.g., energy development, power lines, roads, urban sprawl)	Cluster development and use existing corridors for new infrastructure to minimize fragmentation Follow recommendations in FWP's *Fish and Wildlife Recommendations for Oil and Gas Development in Montana* (In prep) Follow recommendations in FWP's *Fish and Wildlife Recommendations for Wind Energy Development in Montana* (In prep)

Current Impacts	Future Threats	Conservation Actions
		Minimize new surface disturbance by adhering to surface disturbance thresholds as defined in relevant management plans
Habitat conversion	Habitat conversion	Actively engage local working groups, organizations, and agency partnerships to promote and expand greater sage-grouse conservation Follow actions set out in the *Management Plan and Conservation Strategies for Sage Grouse in Montana – Final* (Montana Sage Grouse Work Group 2005) Promote conservation of intact sagebrush grassland landscapes through incentives and easements Provide incentives to maintain grazed grasslands over conversion to croplands Work with landowners and land management agencies to limit activities that may be detrimental to this species
Fences	Fences	Mark fences to reduce collisions
Invasive plant species	Invasive plant species	Apply appropriate range management practices to reduce presence and spread of noxious and invasive plant species
Poor grazing practices	Poor grazing practices	Support livestock grazing management that maintains or improves native rangeland integrity and provides standing herbaceous cover, important for nesting and brood rearing Support research evaluating livestock grazing systems that enhance sage-grouse habitat features and ultimately sage-grouse populations

Current Impacts	Future Threats	Conservation Actions
Rangeland treatments (e.g., prescribed fire and spraying)	Rangeland treatments (e.g., prescribed fire and spraying)	Apply herbicides selectively (i.e., no broadcast application) Consider research on the use of fire to increase stand diversity (forbs) and productivity of invertebrates, especially where brood survival is low due to lack of food resources; any fire use must be carefully evaluated
West Nile virus	West Nile virus	Follow BMPs designed to minimize habitat for the mosquitoes vectors of West Nile virus when constructing new water structures
	Climate change	Continue monitoring of known populations Continue to evaluate current climate science models and recommended actions Monitor habitat changes and address climate impacts through adaptive management as necessary

Additional Citations

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Montana Sage Grouse Work Group. 2005. Management plan and conservation strategies for greater sage-grouse in Montana- Final Montana Sage Grouse Work Group. 200 pp.

Harlequin Duck (*Histrionicus histrionicus*) State Rank: S2B
Species of Greatest Inventory Need Global Rank: G4

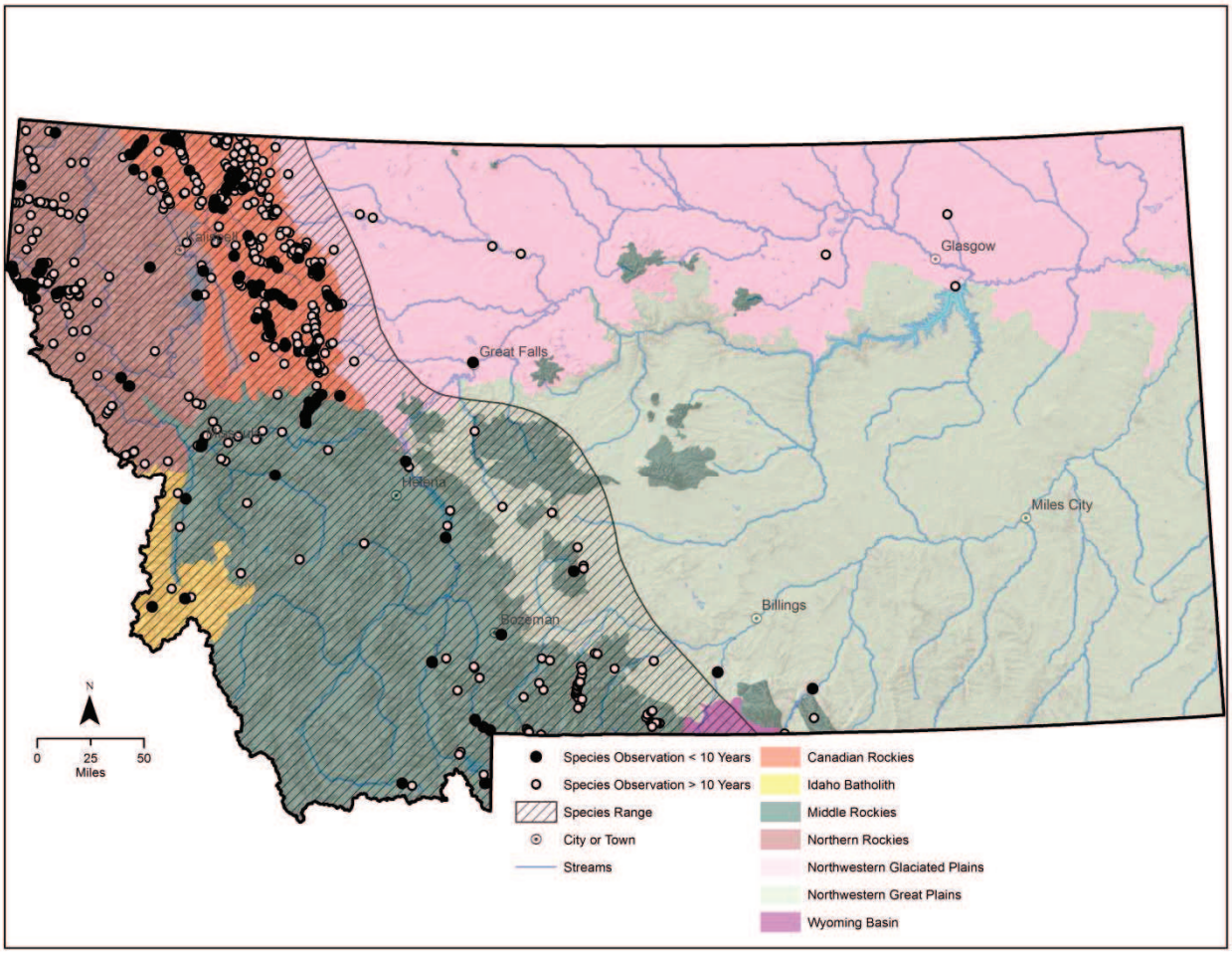

Figure 33. Montana range and observations of the harlequin duck

Habitat

In Montana, most harlequin ducks inhabit fast-moving, low-gradient, clear mountain streams. Overstory in Montana does not appear to affect habitat use: in Glacier National Park, birds used primarily old-growth or mature forest (90%), and most birds in streams on the Rocky Mountain Front were seen in pole-sized timber (Diamond and Finnegan 1993). Banks are most often covered with a mosaic of trees and shrubs, but the only significant positive correlation is with overhanging vegetation (Diamond and Finnegan 1993; Ashley 1994).

Four habitat characteristics were noted at more than 50% of harlequin duck observations in the Tetons (Wallen 1987): 1) streamside perennial shrub vegetation, 2) meandering (braided) channel types, 3) more than 3 loafing sites per 10 meters, and 4) areas unused by humans. Wallen (1987) postulated that human activities might have a greater influence on breeding success than available habitat. Harlequins feed primarily on crustaceans, mollusks, insects, and a few small fishes.

The strongest stream section factor in Montana appears to be for stream reaches with 2-plus loafing sites per 33 feet (Kuchel 1977; Diamond and Finnegan 1993; Ashley 1994). Broods may preferentially use backwater areas, especially shortly after hatching (Kuchel 1977), though this is not apparent in data from other studies (Ashley 1994). Stream width ranges from 10 to 115 feet in Montana. On stream gradients of 7%, occupied stream reaches ranged from 1.8 to 2.8% (Fairman and Miller 1990), while velocity at 42 harlequin observation points ranged from 2.6 to 13.5 feet per second (Diamond and Finnegan 1993). Harlequins in Glacier National Park used straight, curved, meandering, and braided stream reaches in proportion to their availability, as was the case for bottom types (Ashley 1994).

Harlequin ducks breed locally on mountain streams in the western part of the state (Reichel and Genter 1995), including the Kootenai, Flathead, Clark Fork, and Blackfoot river drainages. Scattered breeding also occurs along the Rocky Mountain Front and the northern edge of Yellowstone National Park (YNP). Harlequin ducks are known to occur in Bonner, Boundary, Clearwater, and Shoshone counties in Idaho. Harlequin ducks in Glacier National Park confine almost all activities to swiftly running waters (90% of area used), but also used cut-off side channels and other backwaters during periods of high water and as brood rearing habitat (Kuchel 1977). Females with broods avoided all areas frequented by humans. Occupied streams in northern Idaho were usually in mature/old-growth western red cedar/western hemlock or Engelmann spruce/subalpine fir stands. Cassirer and Groves (1991) suggested that the presence of mature/old-growth forest in northern Idaho might indicate streams with high-quality, low-sediment loads, intact riparian areas, and relative inaccessibility to humans. Stream sections most suitable for harlequin breeding had gradients less than 10 degrees and banks lined with dense perennial shrubs; breeding and brood rearing occurred on streams with a mean gradient less than 30 degrees. In Idaho hens nest in cliff cavities, tree cavities, and on the ground.

Management Plans

Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana. 279 pp.

Cassirer, E. F., J. D. Reichel, R. L. Wallen, and E. C. Atkinson. 1996. Harlequin Duck (*Histrionicus histrionicus*) conservation assessment and strategy for the U.S. Rocky Mountains. Unpublished technical report, Idaho Department of Fish and Game, Lewiston, Idaho.

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Harlequin Duck Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Data poor Outdated survey		Continue survey efforts to find occupied streams throughout its range in the state Develop a statewide population estimate

Current Impacts	Future Threats	Conservation Actions
		Develop monitoring schedule to estimate and evaluate population trend Target species for survey and inventory
Destruction of watershed stability and stream flow regimes	Destruction of watershed stability and stream flow regimes	Maintain and enhance fisheries and aquatic invertebrate populations Maintain backwater areas that are used for brood rearing Maintain large woody debris for nesting sites; in some cases, nest boxes may be erected to supplement natural nesting sites On stream reaches with water control structures, avoid increasing peak flows during nesting season
Human disturbance by paddlers (especially in breeding season)	Human disturbance by paddlers (especially in breeding season)	Consider limiting access and certain types of activities when known to be disturbing to nest sites
Impoundments and diversions on breeding streams	Impoundments and diversions on breeding streams	Encourage watershed management practices that maintain habitat quality throughout the nesting season Explore impoundment removal if possible
Roads	Roads	Decommission old/unused roads Manage road density at or below current levels
Forest management	Forest management	Work with landowners and land management agencies to limit activities that may be detrimental to occupied streams
Water pollution on headwater streams utilized for nesting, brood rearing, and prey base	Water pollution on headwater streams utilized for nesting, brood rearing, and prey base	Work with watershed groups, agencies, organizations, and the public to identify and reduce point source pollution in headwater streams

Current Impacts	Future Threats	Conservation Actions
	Climate change	Continue to evaluate current climate science models and recommended actions Monitor habitat changes and address climate impacts through adaptive management as necessary Routine monitoring of known populations

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Least Tern (*Sterna antillarum*)
Species of Greatest Inventory Need

State Rank: S1B
Global Rank: G4

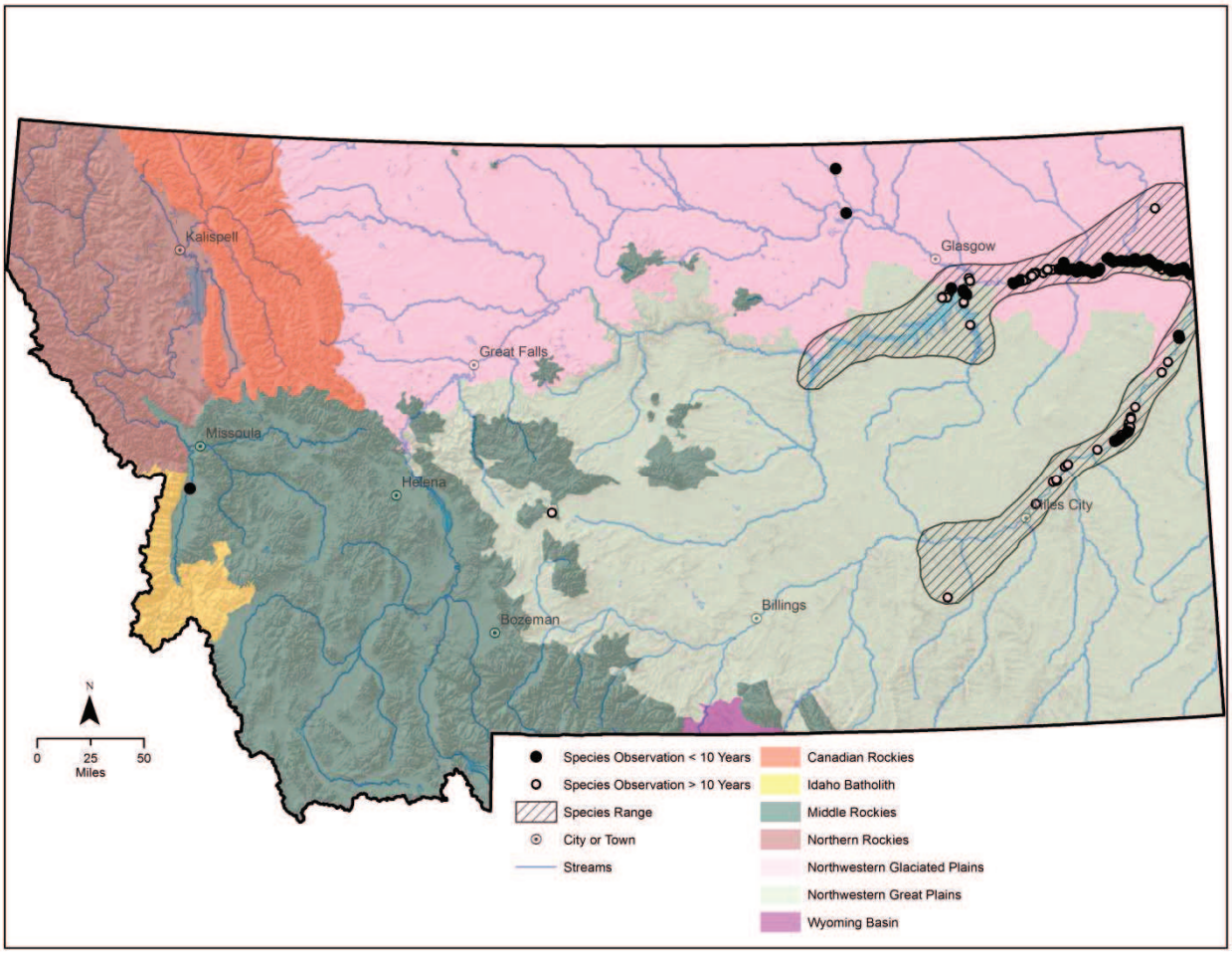

Figure 34. Montana range and observations of the least tern

Habitat

Least terns nest on unvegetated sand-pebble beaches and islands of large reservoirs and rivers in northeastern and southeastern Montana, specifically the Yellowstone and Missouri river systems (Christopherson et al. 1992). These wide, open river channels, and lake and pothole shorelines provide the preferred characteristics for nesting Least Terns. Sites with gravel substrate provide the most suitable sites for nesting (Montana Piping Plover Recovery Committee (MPPRC) 1994). One of the most limiting factors to nesting site selection is vegetational encroachment; Least terns avoid areas where relatively thick vegetation provides cover for potential predators. Fine-textured soils are easier to treat mechanically than rocky or gravelly soils when vegetation is determined as a limiting factor in an area's ability to provide suitable nesting habitat, but fine soils are not typically a preferred nesting substrate (MPPRC 1994).

In Montana, as in other areas, another and more important limiting factor in nest site selection is the location of nesting sites in relation to surrounding water levels. Nests are often inundated because water levels are kept unnaturally high throughout the breeding season and high winds can cause nests to be flooded. In addition, nesting sites may simply not be available because of

encroaching vegetation or because water levels are so high that beaches are under water during the early part of, and possibly throughout, the nesting season (MPPRC 1994).

Management

As identified in the USFWS recovery plan for the least tern, delisting can be considered when 4 censuses confirm that the interior population has reached 7,000 and remains stable for at least 10 years. The goal for the Missouri River system is 2,100 birds (census numbers in 2003 revealed 735 birds for the Missouri River in total; Pavelka personal communication), with 50 individuals as the minimum targeted for Montana's population. Interior least tern counts in the Missouri River drainage continue to fall short of that population target even though extensive recovery efforts have occurred in that drainage over the past decade. This drainage has been extensively impounded and modified, and population size of least terns in the Missouri River drainage remains at or near levels that were present in 1990, despite a high investment in habitat manipulation and management. This indicates that the population has been stable, estimated recoverable carrying capacity of available habitat in the Missouri River drainage was likely overestimated in the 1990 recovery plan, and is not biologically achievable under the existing habitat baseline.

FWP periodically surveys least terns along the Yellowstone but has found average or fewer than average number of birds during the past 5 years of monitoring.

Appropriate water management, that which includes natural seasonal flows, is identified as the major consideration for least tern conservation in Montana, for the greatest threat to breeding pairs, in some years, is the loss of existing nesting sites from inundation by high water at unusual times of the breeding season (MPPRC 1994). Rising water levels late in the nesting season can also decrease overall island size, and may result in assisting local avian predators to locate nests (containing eggs or nestlings) more easily (Erickson and Prellwitz 1999). These conditions reinforce the need to manage reservoirs and dammed rivers in a manner that mimics more natural seasonal fluctuations for the protection of least tern populations. Other management activities beneficial to the species include: instituting grazing management practices more appropriate to the conservation of the least tern; controlling access to key nesting locations; moving nests upslope from areas where flooding of nests is imminent; relocating eggs to nests of other Least Terns for foster incubation; signing of beaches to indicate nesting by least terns (though in areas where there is hostility toward the species, or toward listed species in general, this is not recommended); beach enhancement (grading or burning to remove unwanted encroaching vegetation); raising island elevation to make room to move nests in years with rising water during the nesting season (MPPRC 1994); and timing spring flow releases from Fort Peck Dam to more closely mimic the natural seasonal flows of the river (FWP 2013). Other management activities to enhance habitat or affect better protection for this species includes reducing human, dog, and vehicular disturbance during nesting (FWP 2013).

Management of least terns is under direction of the 1990 USFWS Recovery Plan and the 2006 FWP species management plan that calls for a goal of 50 individuals within Montana.

Management Plans
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Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana. 279 pp.

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Least Tern Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Data poor Outdated survey		Target species for survey and inventory
Food availability	Food availability	Investigate fish prey abundance and foraging success along both the Missouri and Yellowstone rivers
Human disturbance	Human disturbance	Manage human use at nesting beaches Preservation and restoration of suitable nesting habitat through protective easements
Nesting and reproductive success	Nesting and reproductive success	Analysis of the population's likelihood of persistence, using Population Viability Analysis, coupled with a review of the status of the interior least tern Continued annual monitoring of terns coupled with efforts to standardize monitoring and data collection techniques within and between states in the interior U.S.
Pollution and environmental contaminants	Pollution and environmental contaminants	Decrease point and nonpoint inputs of pesticides and heavy metals into rivers and floodplains

Current Impacts	Future Threats	Conservation Actions
Increased predator abundance	Increased predator abundance	Continued site specific use of predator management deterrent and control measures Management of vegetation encroachment to increase nest site availability and security Remove human created structures utilized by predators (e.g. abandoned buildings)
Unpredictable water levels (flooding)	Unpredictable water levels (flooding)	Management of water flows that reduce the potential for nest inundation but allow for periodic bank scouring for habitat creation
Water flow and river dynamics	Water flow and river dynamics	Management of water flows that restore riverine habitats and their associated ecosystem processes

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Lewis's Woodpecker (*Melanerpes lewis*)

State Rank: S2B
Global Rank: G4

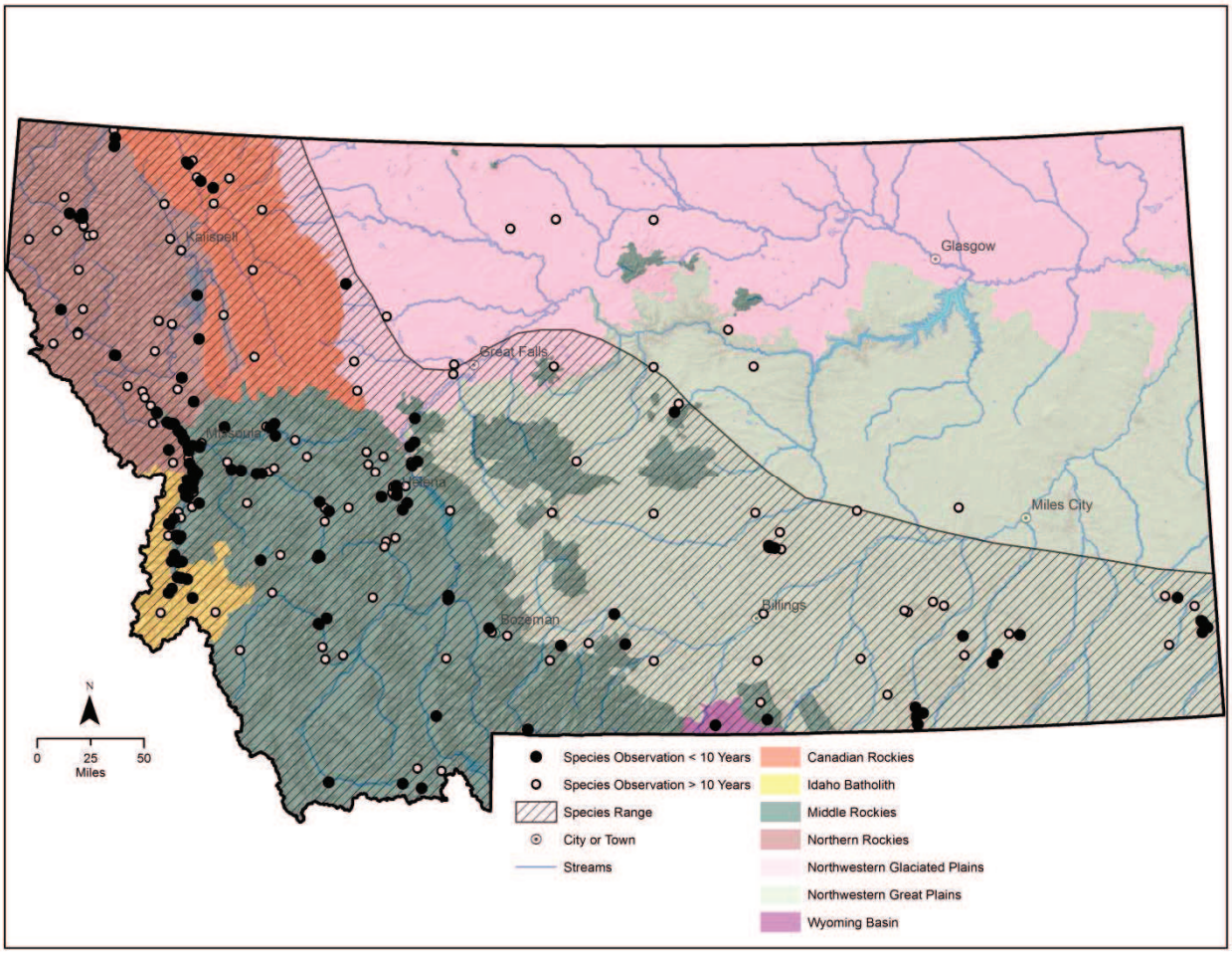

Figure 35. Montana range and observations of the Lewis's woodpecker

Habitat

In the Bozeman area, Lewis's woodpeckers are known to occur in river bottom woods and forest edge habitats (Skaar 1969). Habitat information from other Lewis's woodpecker sources state that the breeding habitat is open forest and woodland, often logged or burned, including oak and coniferous forest; primarily ponderosa pine (*Pinus ponderosa*), riparian woodland and orchards, and less commonly in pinyon-juniper (*Pinus* spp.-*Juniperus* spp.; American Ornithologists Union 1998). Lewis's woodpecker distribution is closely associated with open ponderosa pine forest in western North America, and is strongly associated with fire-maintained old-growth ponderosa pine (Diem and Zeveloff 1980, Tobalske 1997, Saab and Dudley 1998).

Important habitat features include an open tree canopy, a brushy understory with ground cover, dead trees for nest cavities, dead or downed woody debris, perch sites, and abundant insects. Lewis's woodpeckers use open ponderosa pine forests, open riparian woodlands dominated by cottonwood (*Populus* spp.), and logged or burned pine. They also use oak (*Quercus* spp.) woodlands, orchards, pinyon-juniper woodlands, other open coniferous forests, and agricultural lands. Apparently the species prefers open ponderosa pine at high elevations and open riparian

forests at lower elevations (Bock 1970, Tobalske 1997). In the Blue Mountains of Oregon, they showed a preference for open stands near water (Thomas et al. 1979). Because the species catches insects from the air, perches near openings or in open canopy are important for foraging habitat (Bock 1970, Tobalske 1997).

Lewis's woodpeckers often use burned pine forests, although suitability of post-fire habitats varies with the age, size, and intensity of the burn, density of remaining snags, and the geographic region. Birds may move to unburned stands once the young fledge (Block and Brennan 1987, Tobalske 1997, Saab and Dudley 1998). They have been generally considered a species of older burns rather than new ones, moving in several years post-fire once dead trees begin to fall and brush develops, 5 to 30 years after fire (Bock 1970, Block and Brennan 1987, Caton 1996, Linder and Anderson 1998). However, on a 2- to 4-year-old burn in Idaho they were the most common cavity-nester, and occurred in the highest nesting densities ever recorded for the species (Saab and Dudley 1998). As habitat suitability declines, however, numbers decline. For example, in Wyoming, the species was more common in a 7-year-old burn than in a 20-year-old burn (Linder and Anderson 1998). Overall, suitable conditions include an open canopy, availability of nest cavities and perches, abundant arthropod prey, and a shrubby understory (Linder and Anderson 1998, Saab and Dudley 1998).

Unlike other woodpeckers, Lewis's woodpeckers are not morphologically well adapted to excavate cavities in hard wood. They tend to nest in a natural cavity, abandoned northern flicker (*Colaptes auratus*) hole, or previously used cavity, 3 to 170 feet above ground. Sometimes they will excavate a new cavity in a soft snag, dead branch of a living tree, or rotting utility pole (Harrison 1979, Tobalske 1997). The mated pair may return to the same nest site in successive years. On partially logged burns with high nesting densities in Idaho, nest sites were characterized by the presence of large, soft snags and an average of 25 snags per acre that had more than 9-inch diameter at breast height (Saab and Dudley 1998).

In late summer, wandering flocks move from valleys into mountains or from breeding habitat to orchards. In winter, they use oak woodlands and nut and fruit orchards. An important habitat feature in many wintering areas is the availability of storage sites for grains or mast, such as tree bark (e.g. bark of mature cottonwood trees) or power poles with desiccation cracks (Bock 1970, Tobalske 1997). In southwestern Arizona and southeastern California, Lewis's woodpeckers may use scrub oak, pecan orchards, and cottonwoods, but more study is needed in this area (Bock 1970). In Mexico, they use open and semi-open woodlands, especially those with oaks (Howell and Webb 1995).

Management

No known active management is ongoing for Lewis's woodpecker in the state. However, management for Lewis's woodpeckers in dry forests fits very well with the management needs for flammulated owls. The landscape-level needs of the flammulated owl would probably accommodate any habitat-area needs of Lewis's woodpeckers. Specific needs of the Lewis's woodpecker at the microsite and site level could be met in the form of interspersed zones of shrubby understory within the overall habitat mosaic (Casey 2000). Recommendations for snag retention in forest management plans have been developed (Thomas et al. 1979). To sustain a maximum density of Lewis's woodpeckers (6.7 pairs per acre) a density of 101 snags per 100

acres, more than 12 inches in diameter at breast height, and more than 30 feet in height must be maintained in ponderosa pine, riparian cottonwood and mixed-conifer forest (Thomas et al. 1979).

The strongest populations are found within 2 riverine IBAs, the Bitterroot River and Clark Fork River/Grass Valley IBAs. Strengthen conservation efforts within these IBAs and consider additional IBA acreage (if data support).

Management Plan

Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana. 279 pp.

Lewis's Woodpecker Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Development	Development	Encourage usage of FWP's voluntary subdivision recommendations (FWP 2012) with local planners Review sub-division requests and make recommendations based on FWP's *Fish and Wildlife Recommendations for Subdivision Development* (FWP 2012)
Habitat loss: Loss of riparian habitat Loss or alteration of open ponderosa pine stands Snag loss/removal	Continued habitat loss: Logging Loss of riparian habitat Loss or alteration of open ponderosa pine stands Snag loss - nesting	In dry forests with potential habitat, maintain or restore open conditions following management recommendations for flammulated owls; in cottonwood bottomlands retain snags, open forest structure, and shrub cover for a robust arthropod community (Fylling 2013) Manage ponderosa pine stand densities to restore or maintain open, park-like conditions through selective harvest techniques Manage water releases to mimic flooding and help with cottonwood recruitment in riparian areas Provide outreach to private landowners on the importance of retaining snags in riparian bottomland habitat

Current Impacts	Future Threats	Conservation Actions
		Remove Russian olive, salt cedar, and other invasive species from riparian areas Retain sufficient large snags in order to provide soft snags over time Review existing data and consider additional surveys in dry forest and post-fire habitats to determine the importance of these habitats for Montana populations Snag creation in managed forest stands (ponderosa pine, riparian)
	Climate change	Continue to evaluate current climate science models and recommended actions Monitor habitat changes and address climate impacts through adaptive management as necessary Routine monitoring of known populations
	Nest site competition	Appropriate conservation action(s) unknown

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